

## LISTING OF THE CLAIMS

As no claim amendments are submitted with this paper, the following listing of the claims is provided solely for the Examiner's convenience.

1. **(Canceled)**

2. **(Previously presented)** A functionalized isoapoptolidin compound comprising ~~a modified~~ an isoapoptolidin core or a stereoisomer thereof, in which:

(a) at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C<sub>1</sub>-C<sub>24</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>25</sub> acyloxy, C<sub>2</sub>-C<sub>25</sub> haloacyloxy, C<sub>2</sub>-C<sub>25</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>25</sub> carbonato, halogenated C<sub>2</sub>-C<sub>25</sub> carbonato, C<sub>2</sub>-C<sub>25</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>25</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups;

(b) at least one 1,3-diene functionality in the isoapoptolidin core is replaced by the product of a Diels-Alder reaction with a dienophile;

(c) at least one carbon-carbon double bond in the isoapoptolidin core is replaced with a carbon-carbon single bond; and/or

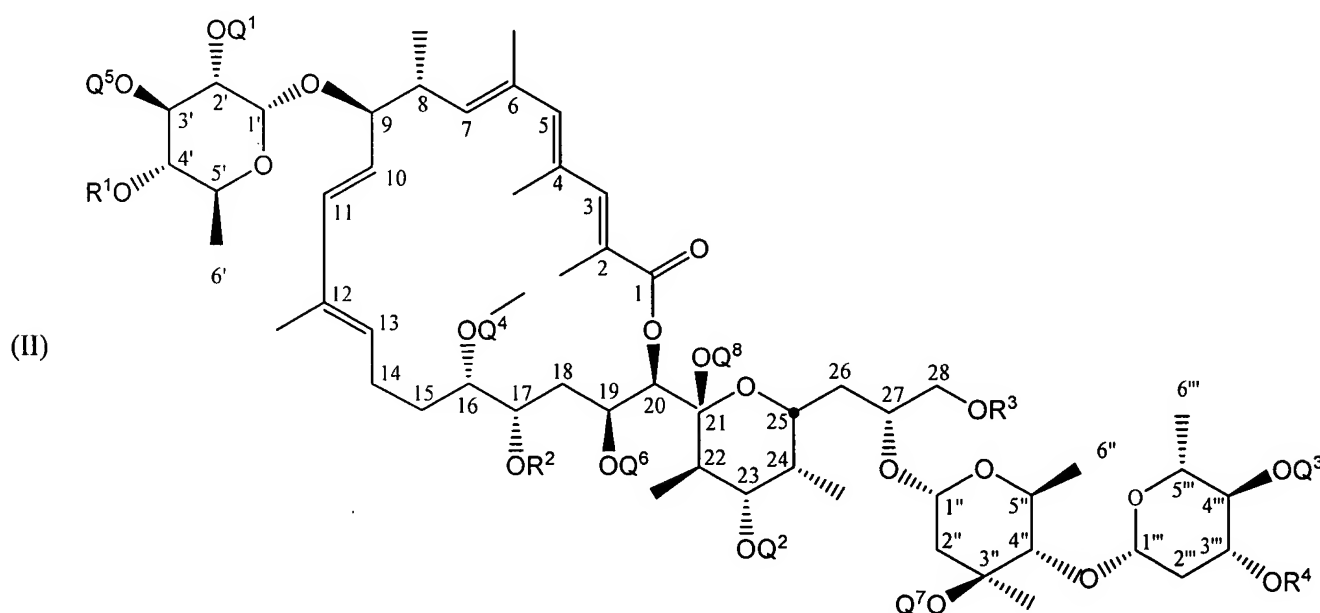
(d) at least one 1,2-diol functionality in the isoapoptolidin core is replaced with a cyclic ether.

3. **(Original)** The functionalized isoapoptolidin compound of claim 2, in which at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C<sub>1</sub>-C<sub>24</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>25</sub> acyloxy, C<sub>2</sub>-C<sub>25</sub> haloacyloxy, C<sub>2</sub>-C<sub>25</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>25</sub> carbonato, halogenated C<sub>2</sub>-C<sub>25</sub> carbonato, C<sub>2</sub>-C<sub>25</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>25</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups.

4. **(Original)** The functionalized isoapoptolidin compound of claim 3, wherein the substituent is selected from C<sub>1</sub>-C<sub>12</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>13</sub> acyloxy, C<sub>2</sub>-C<sub>13</sub> haloacyloxy, C<sub>2</sub>-C<sub>13</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>13</sub> carbonato, halogenated C<sub>2</sub>-C<sub>13</sub> carbonato, C<sub>2</sub>-C<sub>13</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>13</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted sulfamoyloxy, (C<sub>1</sub>-C<sub>6</sub> alkoxy)methyl ether, (C<sub>1</sub>-C<sub>6</sub> alkylthio)methyl ether, and tri(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted silyloxy.

5. **(Original)** The functionalized isoapoptolidin compound of claim 4, wherein the substituent is selected from C<sub>1</sub>-C<sub>12</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>13</sub> acyloxy, and tri(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted silyloxy.

6. **(Original)** A compound having the structure of formula (II)



wherein:

Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are independently selected from H, C<sub>1</sub>-C<sub>12</sub> hydrocarbyl, acyl of the formula -(CO)-R<sup>5</sup> in which R<sup>5</sup> is C<sub>1</sub>-C<sub>12</sub> hydrocarbyl, and hydroxyl-protecting groups; and  
 R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are C<sub>1</sub>-C<sub>12</sub> alkyl or H,  
 or a stereoisomer thereof.

7. **(Original)** The compound of claim 6, having the stereoisomeric configuration of formula (I).

8. **(Original)** The compound of claim 6, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are independently selected from H, C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are C<sub>1</sub>-C<sub>6</sub> hydrocarbyl; and R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are C<sub>1</sub>-C<sub>4</sub> alkyl.

9. **(Original)** The compound of claim 8, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are independently selected from H, C<sub>1</sub>-C<sub>6</sub> alkyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are all methyl or all ethyl; and R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are methyl.

10. **(Original)** The compound of claim 7, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are independently selected from H, C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are C<sub>1</sub>-C<sub>6</sub> hydrocarbyl; and R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are C<sub>1</sub>-C<sub>4</sub> alkyl.

11. **(Original)** The compound of claim 10, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are independently selected from H, C<sub>1</sub>-C<sub>6</sub> alkyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are all methyl or all ethyl; and R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are methyl.

12. **(Original)** The compound of claim 6, wherein:

$Q^1$  is -(CO)-R<sup>5</sup> and  $Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^2$  and  $Q^3$  are -(CO)-R<sup>5</sup> and  $Q^1, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^3$  is -(CO)-R<sup>5</sup> and  $Q^1, Q^2, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^4$  is -(CO)-R<sup>5</sup> and  $Q^1, Q^2, Q^3, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^5$  is -(CO)-R<sup>5</sup> and  $Q^1, Q^2, Q^3, Q^4, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^6$  is -(CO)-R<sup>5</sup> and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^7$ , and  $Q^8$  are H;  
 $Q^6$  is C<sub>1</sub>-C<sub>6</sub> alkyl and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^7$ , and  $Q^8$  are H; or  
 $Q^8$  is C<sub>1</sub>-C<sub>6</sub> alkyl and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^6$ , and  $Q^7$  are H.

13. **(Original)** The compound of claim 12, wherein:

Q<sup>1</sup> is benzoyl and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are acetyl and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

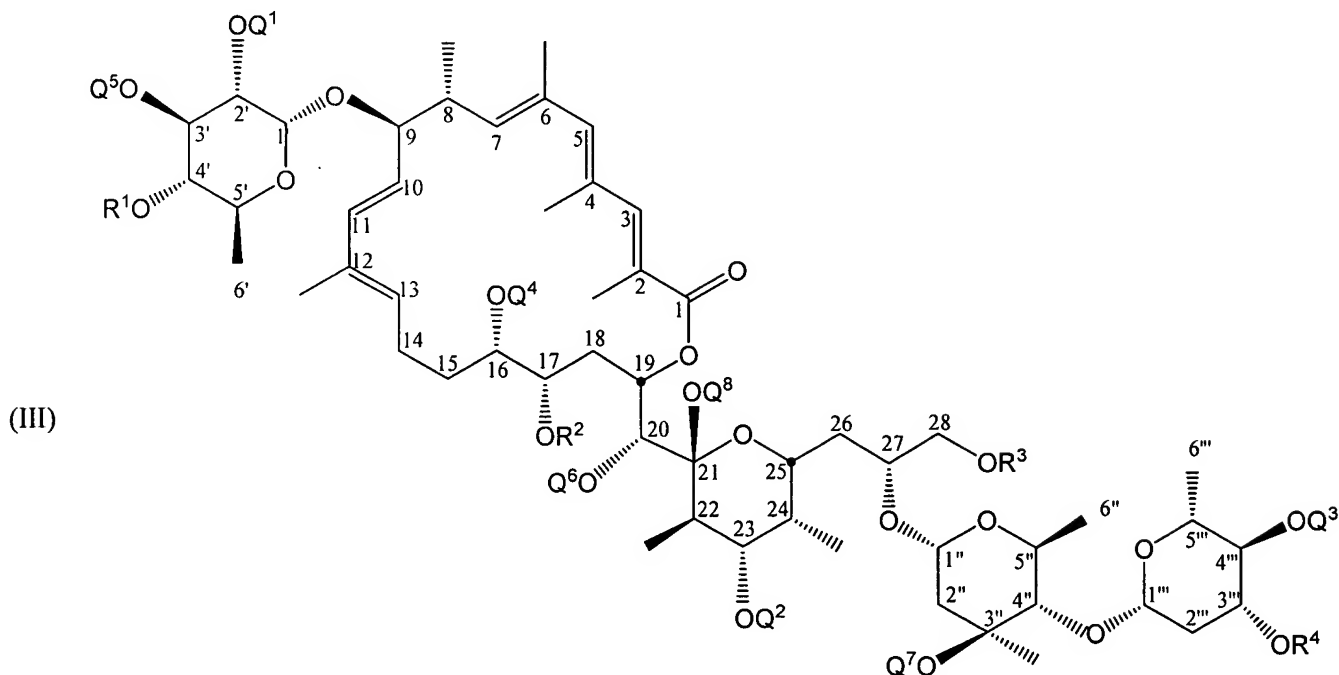
14. **(Original)** The compound of claim 7, wherein:

Q<sup>1</sup> is -(CO)-R<sup>5</sup> and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

15. **(Original)** The compound of claim 14, wherein:

Q<sup>1</sup> is benzoyl and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are acetyl and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

16. **(Previously presented)** A compound having the structure of formula (III)



wherein:

$Q^1$ ,  $Q^2$ ,  $Q^3$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^7$ , and  $Q^8$  are selected from H,  $C_1$ - $C_{12}$  hydrocarbyl, acyl of the formula - $(CO)-R^5$  in which  $R^5$  is  $C_1$ - $C_{12}$  hydrocarbyl, and hydroxyl-protecting groups; and

$R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  are  $C_1$ - $C_{12}$  alkyl or H, with the proviso that at least one of  $Q^1$ ,  $Q^2$ ,  $Q^3$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^7$ , and  $Q^8$  is other than H when  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  are methyl and the compound has the stereoisomeric configuration of formula (III), or a stereoisomer thereof.

17. **(Original)** The compound of claim 16, having the stereoisomeric configuration of formula (III).

18. **(Original)** The compound of claim 16, wherein:

$Q^1$ ,  $Q^2$ ,  $Q^3$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^7$ , and  $Q^8$  are selected from H,  $C_1$ - $C_6$  hydrocarbyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1$ - $C_6$  hydrocarbyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6$ ,  $R^7$ , and  $R^8$  are  $C_1$ - $C_6$  hydrocarbyl; and  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  are  $C_1$ - $C_4$  alkyl.

19. **(Original)** The compound of claim 18, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are selected from H,  $C_1-C_6$  alkyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1-C_6$  alkyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6, R^7$ , and  $R^8$  are all methyl or all ethyl; and  
 $R^1, R^2, R^3$ , and  $R^4$  are methyl.

20. **(Original)** The compound of claim 17, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are selected from H,  $C_1-C_6$  hydrocarbyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1-C_6$  hydrocarbyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6, R^7$ , and  $R^8$  are  $C_1-C_6$  hydrocarbyl; and  
 $R^1, R^2, R^3$ , and  $R^4$  are  $C_1-C_4$  alkyl.

21. **(Original)** The compound of claim 20, wherein:

$Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are selected from H,  $C_1-C_6$  alkyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1-C_6$  alkyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6, R^7$ , and  $R^8$  are all methyl or all ethyl; and  
 $R^1, R^2, R^3$ , and  $R^4$  are methyl.

22. **(Original)** The compound of claim 16, wherein:

$Q^1$  is  $-(CO)-R^5$  and  $Q^2, Q^3, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^2$  and  $Q^3$  are  $-(CO)-R^5$  and  $Q^1, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^3$  is  $-(CO)-R^5$  and  $Q^1, Q^2, Q^4, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^4$  is  $-(CO)-R^5$  and  $Q^1, Q^2, Q^3, Q^5, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^5$  is  $-(CO)-R^5$  and  $Q^1, Q^2, Q^3, Q^4, Q^6, Q^7$ , and  $Q^8$  are H;  
 $Q^6$  is  $-(CO)-R^5$  and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^7$ , and  $Q^8$  are H;  
 $Q^6$  is  $C_1-C_6$  alkyl and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^7$ , and  $Q^8$  are H; or  
 $Q^8$  is  $C_1-C_6$  alkyl and  $Q^1, Q^2, Q^3, Q^4, Q^5, Q^6$ , and  $Q^7$  are H.

23. **(Original)** The compound of claim 22, wherein:

Q<sup>1</sup> is benzoyl and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are acetyl and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

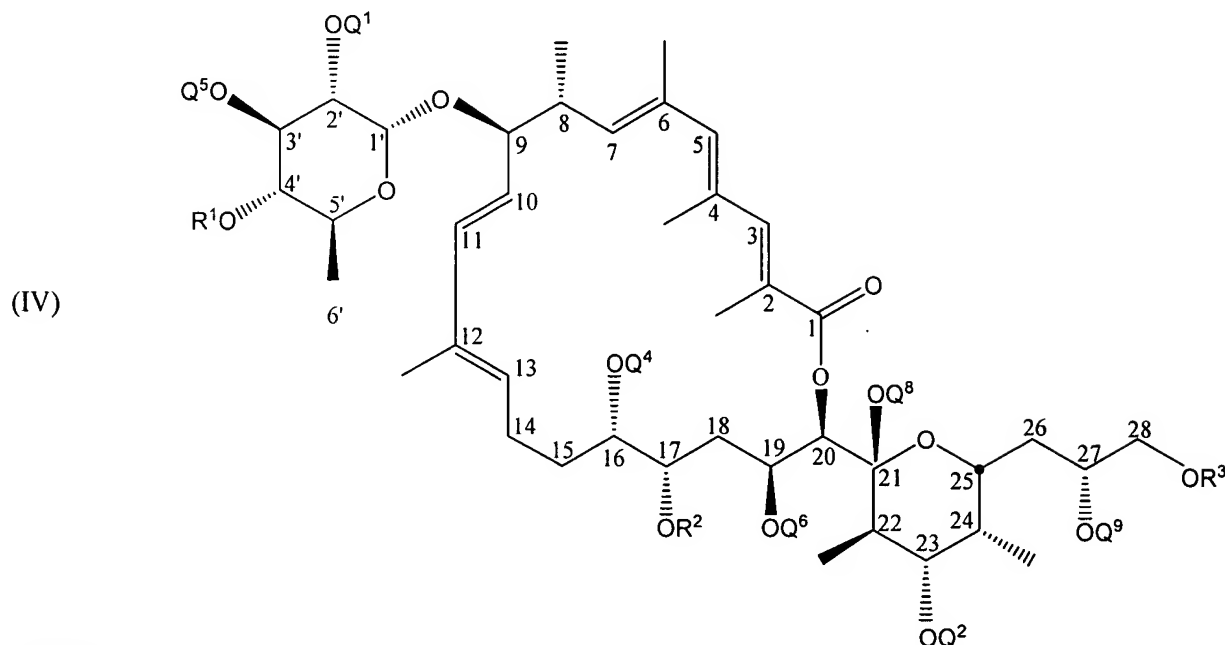
24. **(Original)** The compound of claim 17, wherein:

Q<sup>1</sup> is -(CO)-R<sup>5</sup> and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is -(CO)-R<sup>5</sup> and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

25. **(Original)** The compound of claim 24, wherein:

Q<sup>1</sup> is benzoyl and Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>2</sup> and Q<sup>3</sup> are acetyl and Q<sup>1</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>3</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>4</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>5</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>6</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is acetyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H;  
Q<sup>6</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>7</sup>, and Q<sup>8</sup> are H; or  
Q<sup>8</sup> is methyl and Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, and Q<sup>7</sup> are H.

26. **(Original)** A compound having the structure of formula (IV)



wherein:

$Q^1$ ,  $Q^2$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^8$ , and  $Q^9$  are independently selected from H,  $C_1$ - $C_{12}$  hydrocarbyl, acyl of the formula  $-(CO)-R^5$  in which  $R^5$  is  $C_1$ - $C_{12}$  hydrocarbyl, and hydroxyl-protecting groups; and  $R^1$ ,  $R^2$ , and  $R^3$  are independently selected from  $C_1$ - $C_{12}$  alkyl and H, or a stereoisomer thereof.

27. **(Original)** The compound of claim 26, having the stereoisomeric configuration of formula (IV).

28. **(Original)** The compound of claim 26, wherein:

$Q^1$ ,  $Q^2$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^8$ , and  $Q^9$  are independently selected from H,  $C_1$ - $C_6$  hydrocarbyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1$ - $C_6$  hydrocarbyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6$ ,  $R^7$ , and  $R^8$  are  $C_1$ - $C_6$  hydrocarbyl; and  $R^1$ ,  $R^2$ , and  $R^3$  are  $C_1$ - $C_4$  alkyl.

29. **(Original)** The compound of claim 28, wherein:

$Q^1$ ,  $Q^2$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^8$ , and  $Q^9$  are independently selected from H,  $C_1$ - $C_6$  alkyl,  $-(CO)-R^5$  wherein  $R^5$  is  $C_1$ - $C_6$  alkyl, and  $-Si(R^6R^7R^8)$  wherein  $R^6$ ,  $R^7$ , and  $R^8$  are all methyl or all ethyl; and  $R^1$ ,  $R^2$ , and  $R^3$  are methyl.



30. **(Original)** The compound of claim 27, wherein:  
Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>8</sup>, and Q<sup>9</sup> are independently selected from H, C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> hydrocarbyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are C<sub>1</sub>-C<sub>6</sub> hydrocarbyl; and R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are C<sub>1</sub>-C<sub>4</sub> alkyl.
31. **(Original)** The compound of claim 30, wherein:  
Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>4</sup>, Q<sup>5</sup>, Q<sup>6</sup>, Q<sup>8</sup>, and Q<sup>9</sup> are independently selected from H, C<sub>1</sub>-C<sub>6</sub> alkyl, -(CO)-R<sup>5</sup> wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, and -Si(R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>) wherein R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> are all methyl or all ethyl; and R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are methyl.
32. **(Previously presented)** A compound prepared by reaction of the compound of claim 6 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.
33. **(Previously presented)** A compound prepared by reaction of the compound of claim 16 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.
34. **(Previously presented)** A compound prepared by reaction of the compound of claim 26 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.
35. **(Original)** The compound of any one of claims 32, 33, and 34, wherein the dienophile is an N-halosuccinimide.
36. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 6, wherein at least one carbon-carbon double bond of the compound of claim 6 is converted to a single bond.
37. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 16, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

38. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 26, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

39. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 6, wherein at least one carbon-carbon double bond of the compound of claim 6 is converted to a single bond.

40. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 16, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

41. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 26, wherein at least one carbon-carbon double bond of the compound of claim 26 is converted to a single bond.

42. **(Previously presented)** The compound of claim 6, wherein at least one 1,2-diol functionality of the compound of claim 6 is converted to a cyclic ether.

43. **(Previously presented)** The compound of claim 16, wherein at least one 1,2-diol functionality of the compound of claim 16 is converted to a cyclic ether.

44. **(Previously presented)** The compound of claim 26, wherein at least one 1,2-diol functionality of the compound of claim 26 is converted to a cyclic ether.

45. **(Previously presented)** A pharmaceutical composition comprising a therapeutically effective amount of the compound of claims 2, 6, 16, 26 or 58 and a pharmaceutically acceptable carrier.

46. **(Original)** The composition of claim 45, wherein the therapeutically effective amount is a unit dosage and the composition is composed of a unit dosage form.

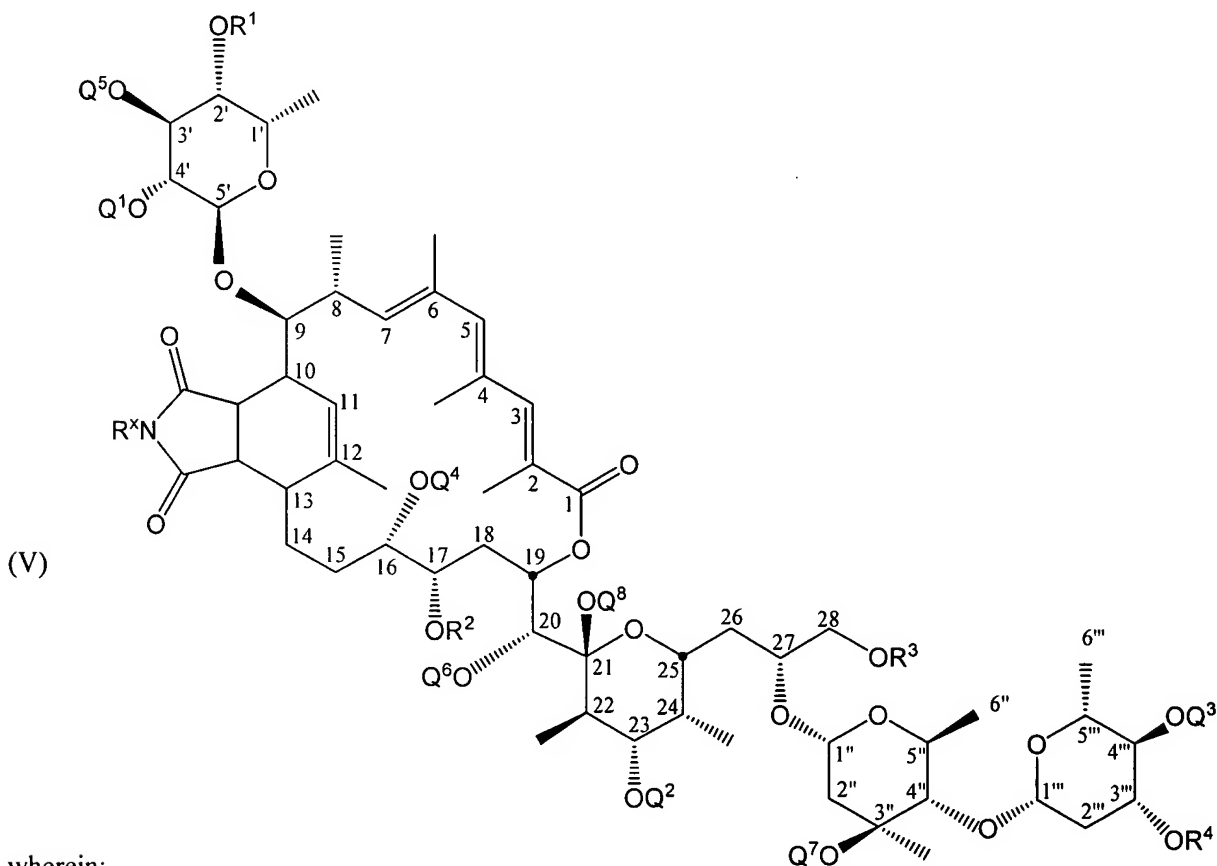
47. **(Original)** The composition of claim 45, comprising a sustained release formulation.

48. **(Previously presented)** A method for inducing apoptosis in cancer cells, wherein the compound of anyone of claims 2, 6, 16, 26, or 58 is administered to the cancer cells.

49. **(Canceled)**

50. **(Original)** A composition of matter comprising deglycosylated isoapoptolidin in isolated, purified form.

51. **(Original)** A compound having the structure of formula (V)



wherein:

$Q^1$ ,  $Q^2$ ,  $Q^3$ ,  $Q^4$ ,  $Q^5$ ,  $Q^6$ ,  $Q^7$ , and  $Q^8$  are independently selected from H,  $C_1$ - $C_{12}$  hydrocarbyl, acyl of the formula  $-(CO)-R^5$  in which  $R^5$  is  $C_1$ - $C_{12}$  hydrocarbyl, and hydroxyl-protecting groups; and  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  are  $C_1$ - $C_{12}$  alkyl or H, or a stereoisomer thereof.

52. **(Currently amended)** ~~Compounds prepared by oxidatively cleaving the~~ The compound of claim 51 oxidatively cleaved at the C-20/C-21 bond in the compound of claim 51.

53. **(Currently amended)** ~~Compounds prepared by oxidatively cleaving the~~ The compound of claim 51 oxidatively cleaved at the C-22/C-23 bond in the compound of claim 51.

54. **(Currently amended)** A functionalized apoptolidin compound comprising ~~a modified~~ an apoptolidin core in which:

(a) at least one hydroxyl group in the apoptolidin core is replaced with a substituent selected from C<sub>1</sub>-C<sub>24</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>25</sub> acyloxy, C<sub>2</sub>-C<sub>25</sub> haloacyloxy C<sub>2</sub>-C<sub>25</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>25</sub> carbonato, halogenated C<sub>2</sub>-C<sub>25</sub> carbonato, C<sub>2</sub>-C<sub>25</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>25</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups;

(b) at least one 1,3-diene functionality in the apoptolidin core is replaced by the product of a Diels-Alder reaction with a dienophile;

(c) at least one carbon-carbon double bond in the apoptolidin core is replaced with a carbon-carbon single bond; and/or

(d) at least one 1,2-diol functionality in the apoptolidin core is replaced with a cyclic ether.

55. **(Original)** The functionalized apoptolidin compound of claim 54, in which at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C<sub>1</sub>-C<sub>24</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>25</sub> acyloxy, C<sub>2</sub>-C<sub>25</sub> haloacyloxy C<sub>2</sub>-C<sub>25</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>25</sub> carbonato, halogenated C<sub>2</sub>-C<sub>25</sub> carbonato, C<sub>2</sub>-C<sub>25</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>25</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>24</sub> hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups.

56. **(Original)** The functionalized apoptolidin compound of claim 55, wherein the substituent is selected from C<sub>1</sub>-C<sub>12</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>13</sub> acyloxy, C<sub>2</sub>-C<sub>13</sub> haloacyloxy, C<sub>2</sub>-C<sub>13</sub> thioacyloxy, C<sub>2</sub>-C<sub>25</sub> thiohaloacyloxy, C<sub>2</sub>-C<sub>13</sub> carbonato, halogenated C<sub>2</sub>-C<sub>13</sub> carbonato, C<sub>2</sub>-C<sub>13</sub> thiocarbonato, halogenated C<sub>2</sub>-C<sub>13</sub> thiocarbonato, carbamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted carbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted sulfamoyloxy, (C<sub>1</sub>-C<sub>6</sub> alkoxy)methyl ether, (C<sub>1</sub>-C<sub>6</sub> alkylthio)methyl ether, and tri(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted silyloxy.

57. **(Original)** The functionalized apoptolidin compound of claim 56, wherein the substituent is selected from C<sub>1</sub>-C<sub>12</sub> hydrocarbyloxy, C<sub>2</sub>-C<sub>13</sub> acyloxy, and tri(C<sub>1</sub>-C<sub>12</sub> hydrocarbyl)-substituted silyloxy.

58. **(New)** A composition of matter comprising isoapoptolidin in isolated, purified form.